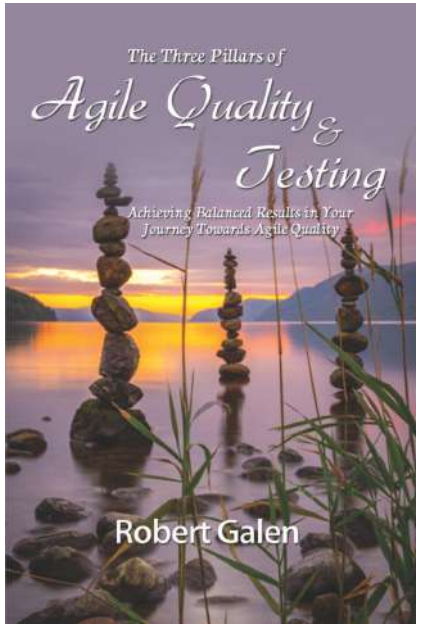
Agile Test Automation Pyramid
Revisited



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Principle Agile Coach at Vaco Agile in Raleigh, NC

Agile Trainer & Coach at RGalen CG

- Somewhere “north” of 30 years experience
- Wide variety of technical stacks and business domains
- Roots of a software developer
- Senior/Executive software development leadership for 20+ years
- Agile “Coach of Coaches” and Leaders
- Deep XP, Lean, Scrum, and Kanban experience since late 1990’s
- From Cary, North Carolina; husband, father, grandfather, and dog lover

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Outline

1. 3-Pillars
2. Agile Test Automation Pyramid
3. Implementation Strategy
4. Communication
5. Wrap-up

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3-Pillars of Agile
Quality & Testing

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3-Pillars Genesis

- I've learned that "Balance" is important
- A sad tale of:
  - Thousands of ATDD testing; Gherkin run amok
  - All of them are working; continuously testing; increasing "coverage' and life is Good!
- BUT
  - These same teams couldn't write a cohesive User Story to save their life
  - So, where were the Acceptance Tests coming from?

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3-Pillars of Agile Quality

Development & Test Automation

- Pyramid-based Strategy: (Unit + Cucumber + Selenium)
- Continuous Integration
- Attack technical infrastructure in the Backlog
- Visual Feedback – Dashboards
- Actively practice ATDD and BDD

Software Testing

- Risk-based testing: Functional & Non-Functional
- Test planning @ Release & Sprint levels
- Exploratory Testing
- Standards – checklists, templates, repositories
- Balance across manual, exploratory & automation

Cross-Functional Team Practices

- Team-based Pairing
- Stop-the-Line Mindset
- Code Reviews & Standards
- Active Done-Ness
- Aggressive Refactoring of Technical Debt
- User Stories, "3 Amigo" based Conversations

- Whole Team Ownership of "Quality"
- Knowing the Right Thing to Build; And Building it Right
- Healthy – Agile Centric Metrics
- Steering via: Center of Excellence or Community of Practice
- Strategic balance across 3 Pillars; Assessment, Recalibration, and Continuous Improvement

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Foundation of the 3-Pillars

- Whole Team Ownership of "Quality"
- Knowing the "Right" thing to Build AND Building it "Right"
- Healthy – Agile Centric Metrics
- Steering Required – CoE or CoP
- Strategic balance across 3 Pillars; Assessment, Recalibration, and Continuous Improvement

- Whole team view includes building it right, everyone tests, everyone demo's, etc.
- Focus on features/stories, confirmation, conversation, and getting them staged properly OVER testing
- 4-tier metrics: Quality, Value, Prediction, Team
- Agile strategies need light-handed "steering"; establish a CoE (heavier weight) or a CoP (lightweight)
- Consider finding an assessment framework and then tying it to your strategy measurement, recalibration, and continuous improvement.
- Make the foundation visible thru information radiators and metrics

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A central part of agile adoption is focusing on CI, 3-tiered Automation development, and Dashboards to begin incrementally building coverage for faster feedback on changes.

100% automation is NOT the Goal!

In the interim, Hardening or Stabilization Sprints and having a risk-based Release Train concept help

It's important that Test or QA not 'own' the tooling or all of the automation efforts. The strategy can come from QA, but the tactical automation development is best left to the team.

Mature teams invest in Automation, Tooling, and Technical Debt reduction as part of Done-ness and continually add it to their backlogs

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3-Pillars of Agile Quality

Software Testing

- Risk-based testing: Functional & Non-Functional
- Test planning @ Release & Sprint levels
- Exploratory Testing
- Standards – checklists, templates, repositories
- Balance across manual, exploratory & automation

Exploratory Testing (SBET with pairing) can be an incredibly effective way to establish a whole-team, collaborative view towards quality and testing. It also emerges new tests.

Leverage 'plans' as a whole-team collaboration-conversation mechanism; at Sprint and Release levels.

Do not measure testing or tester progress; instead, measure throughput, output, sprint outcomes, and done-ness escapes at a team level.

You need a balanced test team; not everyone needs to be able to program. But everyone needs to be passionately skilled testers with curiosity.

Agile testing is a Risk-Based play in every Sprint and across a release sequence.

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3-Pillars of Agile Quality

Cross-Functional Team Practices

- Team-based Pairing
- Stop-the-Line Mindset
- Code Reviews & Standards
- Active Done-Ness
- Aggressive Refactoring of Technical Debt
- User Stories – 3 Amigo based Conversations

One of the hardest areas to get 'right' culturally. It needs leadership alignment from Quality/Testing to Product to Development and a consistent voice of whole-team approaches.

This is where LEAN Thinking lives, where whole-team collaboration happens, where professionalism and craftsmanship are held dear.

I like the view of testers becoming the VOC, champions of quality, and consistent questioners of what is being build. Are we solving the right problems…as simply as possible. Notions of Minimal Viable Product / Feature help with focus.

And yes Virginia, there ARE standards, templates, and a focus on x-team consistency!

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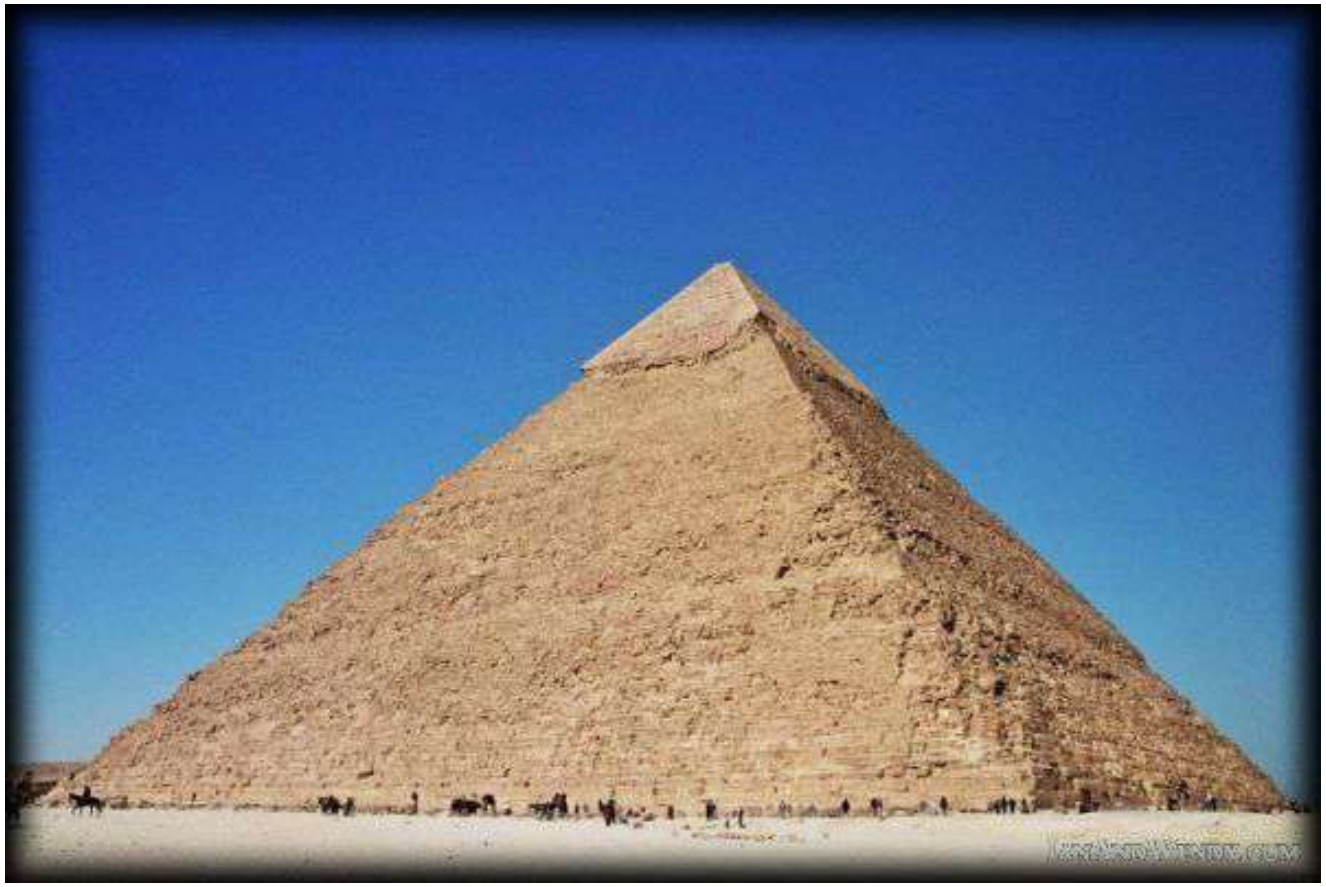
Agile Test Automation Pyramid



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Agile Test Automation Pyramid

- Coined by Mike Cohn, ~ 2005
- Establishes the validity of turning Traditional Automation – upside down

- Invests:
  - Most effort (%) in Unit Tests
  - Moderate effort (%) in Middle-tier tests (business logic, API, component, feature)
  - Least effort (%) in UI-centric, top down tests

- Granularity of the tests is part of the strategy

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Agile Test Automation Pyramid

Often:

- Tied to Definition-of-Done from a maintenance perspective
  - You break it, you fix it
- Percentages vary; intent does not
- Whole-team ownership of automation
  - Although it skews at either end of the pyramid
- Run as much as possible
  - Check-in, Overnight, Cyclically
  - Prime Directive = Real-time Feedback

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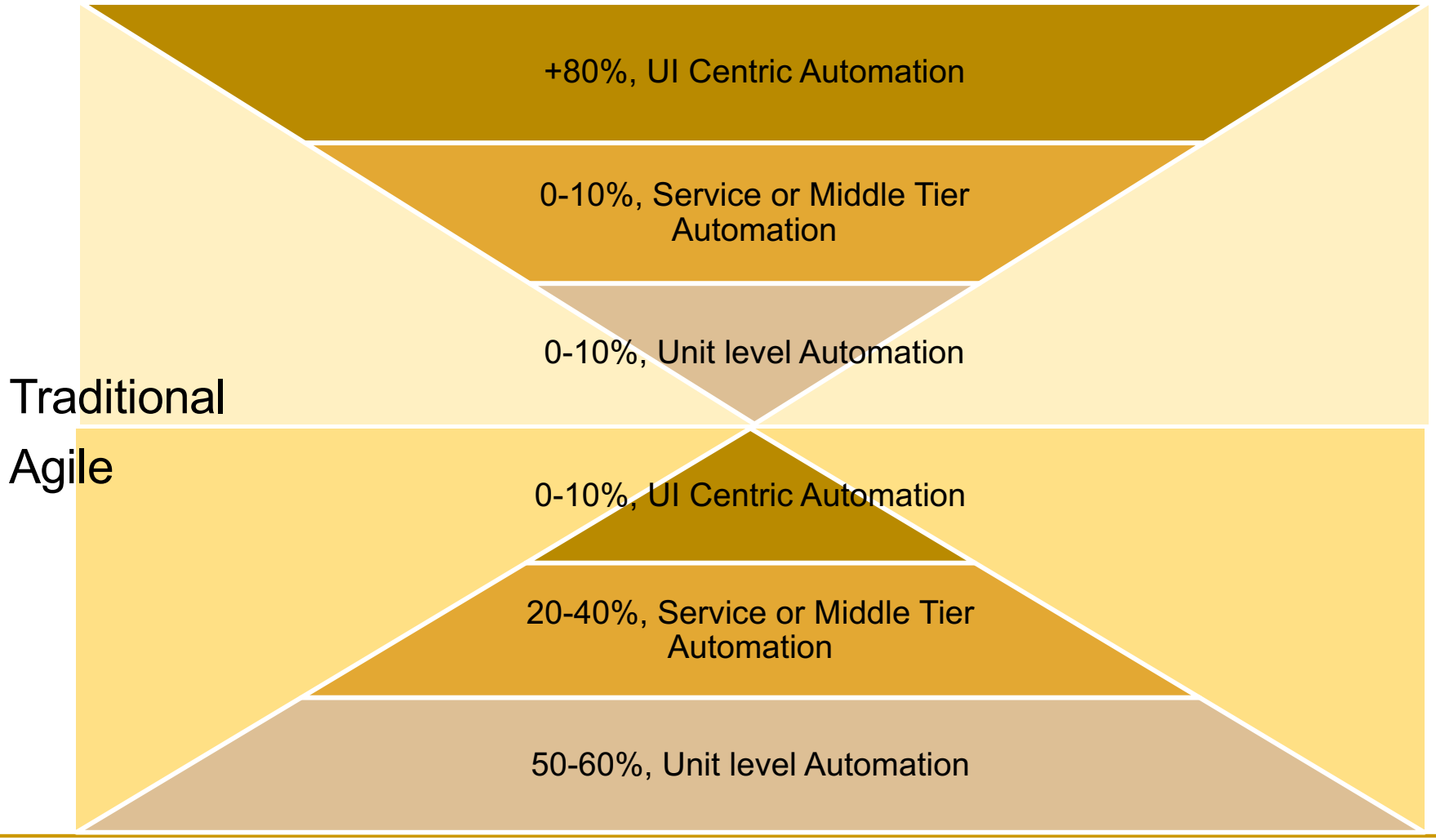
Agile Test Automation Pyramid



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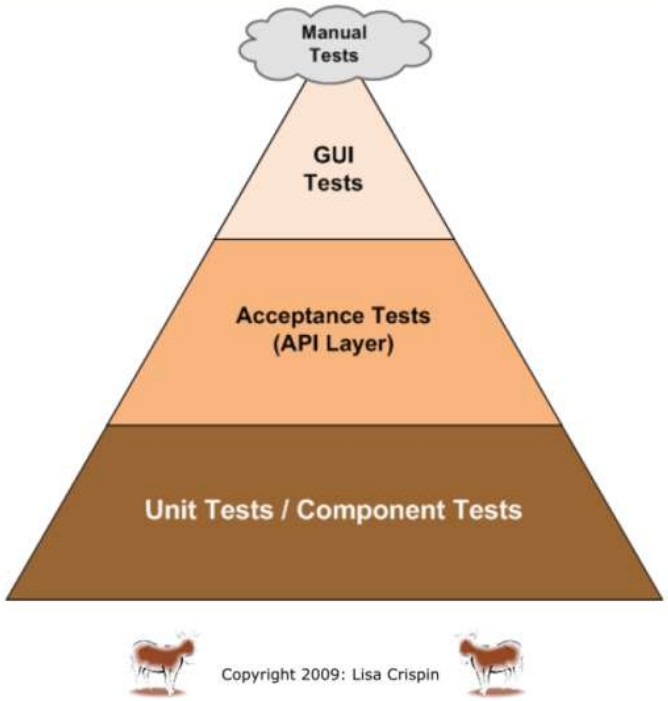
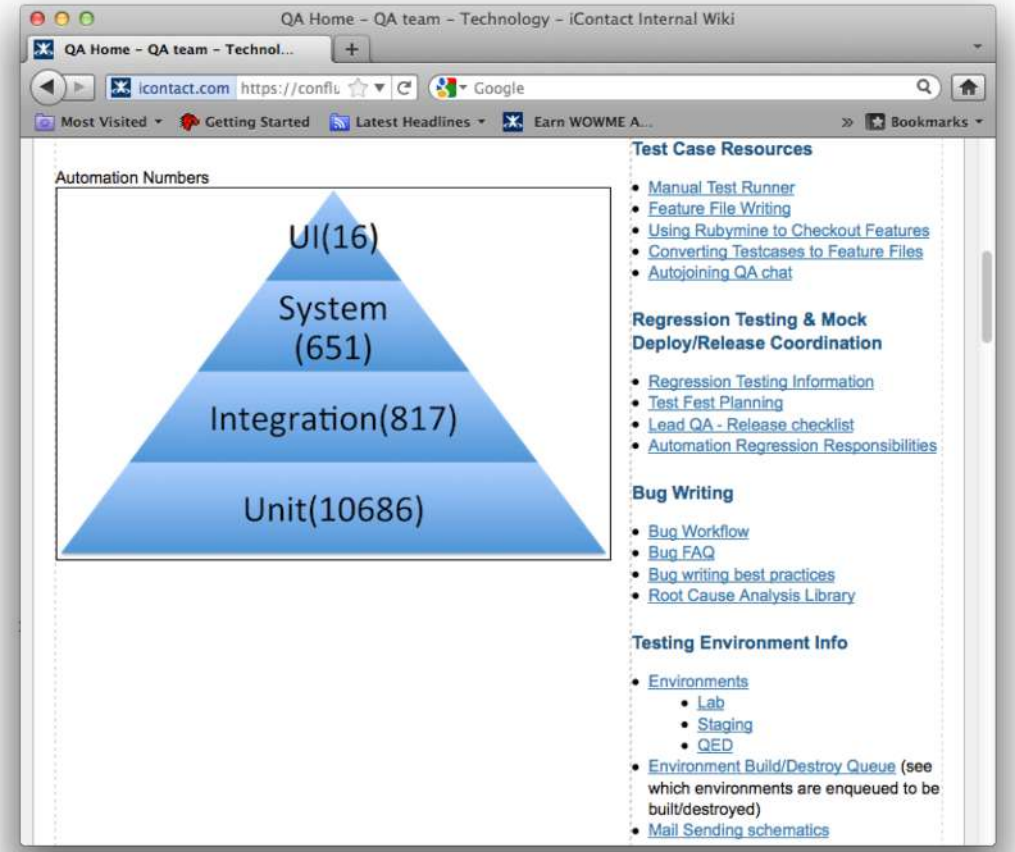
Agile Test Automation Pyramid

Mike Cohn; Lisa Crispin & Janet Gregory
http://behaviordrivendevelopment.wikispaces.com/Testing

Test Automation Pyramid





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Definition of Done
iContact example

- As part of story design, consider 3-levels of automation required for solid implementation:
  - Unit
  - Cucumber
  - Selenium
- If the team warrants the automation has value (ROI) then automate it
- Implement those automated test cases WITH the story
- Demonstrate them in the Sprint Demo

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Definition of Done
iContact example

- Previous sprint automation needs to continue to work; if you break it…then Fix It!
- Previous CI/CD – automation wiring needs to continue to work; if you break it…then Fix It!
- All appropriate (RBT) Acceptance Tests should be regressed so that we haven't "lost value"

- And in Readiness Criteria
  - Automation research spikes and architectural look-ahead

Agile Test Automation Implementation Strategy

Automation is one of the foundational investments of effective Agile Adoptions. It's not a choice, it's an imperative! It's a cost of doing business.

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Implementation Strategy

Typically a 5-Phased Strategy

1. *Strategy – This session: 3 Pillars + Pyramid + Team*

2. Team Formation
3. Tools Selection
4. Training & Infrastructure Development
5. Automation Development
6. Care & Feeding

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Phase 2
Team Formation

- GOAL…whole team ownership
- Skill-set discussion; SDET vs. Test Professional?
- May influence
  - Development focus on Unit Testing
  - Automation team to “gain momentum”
  - Agile execution (Scrum, Kanban, transparency, demo, etc)
- Connect the dots architecturally
- Bias: I like to lead automation with a Test Automation Architect
  - Rather than with someone from the development team

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Phase 3
Tools Selection

- Open Source vs. Commercial
- Singular, all-purpose vs. Tool-kit
  - Cobble together or Integrate disparate tools
- Always perform a “Bake off” within your teams
- If Open Source, consider support implications
- Connect to development tooling
  - Including CI and CD
- Additional Considerations: Test data, virtualization, DevOps
- Be prepared to iterate, learn, and possibly fail

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Phase 4
Training & Infrastructure

- Design, coding, and documentation standards
- Templates
- Community of Practice
  - Example code, standards, forum, collaborative groups
- Models:
  - Keyword, Data-driven, Table-driven, DSL, Model-driven, others
  - Test Suite; Hierarchy, Naming
- Commercial: invest in training and/or consulting
- Open Source: hire and/or acquire direct expertise
  - Also can build the expertise

Phase 5
Automation Development

- Move it to your teams ASAP
- Make it a part of Definition-of-Done
  - It should become a natural outcome and not a choice or question
- Complete it within each sprint
  - SAFe as a goal model for completing work in the same sprint!
  - Salesforce as well
- It needs to be a negotiated part of your Product Backlog
- Have % targets;
- For every story:
  - The TEAM decides the requisite automated tests at each level of the pyramid?

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Phase 5
Automation Development

Attacking the Pyramid

- Usually I attack the Unit-level first
  - Development team engagement; sheer #'s
  - Baseline quality improvement
  - Integrated with CI/CD; fast feedback
- Then select either middle or UI tier; context based
  - Tools selection
  - Training
  - Framework development

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Phase 5
Automation Development

Attacking the Pyramid

- Complete one layer nearly completely before moving to the next layer
- Unit Test Strategy – Don't dig the "hole" any deeper
  - Legacy vs. New
  - Encapsulate vs. Proper unit tests
  - Refactoring implications

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Phase 6
Care & Feeding

- Definition of Done & Product Backlogs
- Automation evolution roadmap
  - Merge with your architectural look-ahead
  - Merge with your Product Roadmap
  - Factor in ongoing automation investments
- Refactoring & Repairs as part of your Technical Debt handling
- Consider it at the same level of investment as your application code
- Stop-the-Line
- Commitment

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Wrapping up…

- I hope we've added to your previous assumptions and understanding of the Agile Test Automation Pyramid
- And added the 3-Pillars to your thinking toolkit
- Final questions or discussion?

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Contact Info

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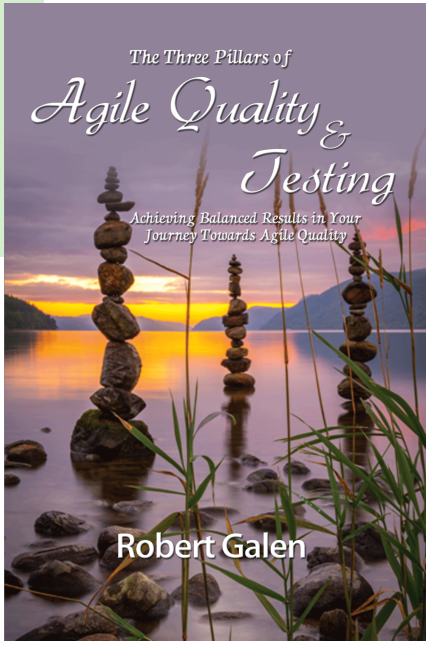

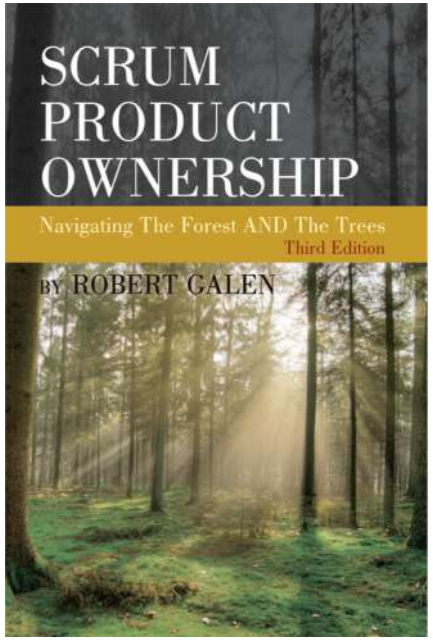

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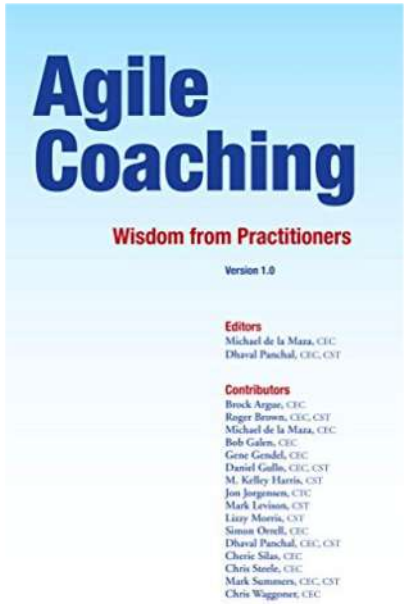
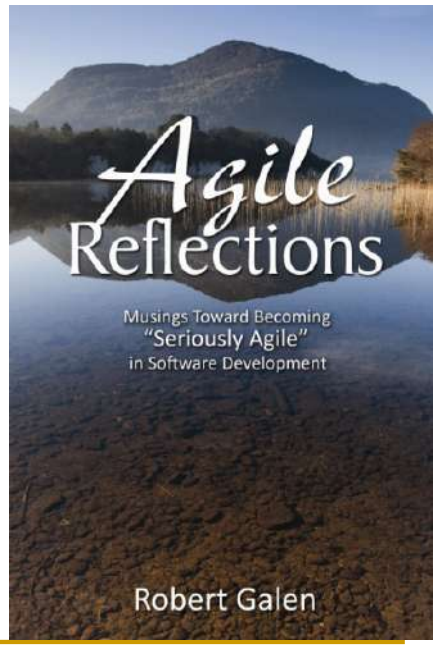
http://www.meta-cast.com/





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